

seem to have been well ossified, but much constricted, and all those preserved belong to the abdominal region. Nothing can be added to the description of the dorsal scutes given by Davis; but appearances suggest that at the broken hinder end of the fossil the row of scutes terminates, while the dorsal fin begins. The only scales shown are those of the two swallowed fishes in the abdomen.

On the whole, it seems probable that *Pantopholis* will prove to be a member of the same extinct family of Scopeloids as *Enchodus*. It is remarkable for the length and slenderness of the abdominal region, the large size of the pectoral fins, and the unusually numerous median dorsal scutes.

XXXIV.—*Key to the Isopods of the Pacific Coast of North America, with Descriptions of Twenty-two new Species.* By HARRIET RICHARDSON.

[Concluded from p. 277.]

IV. ASELLOTA.

Analytical Key to the Families of Asellota.*

- | | |
|---|-----------------------|
| <p>a. Lateral parts of cephalon scarcely expanded. Eyes, when present, small, lateral. Peduncle of inferior antennæ without small accessory appendage outside of third joint. Legs ambulatory, except first pair, which are distinctly subcheliform; legs with dactylus generally uniungiculate. First pair of pleopoda in female very small, not operculiform. Outer lamella of second pair very large and incrustated, so as to form, together with corresponding lamellæ of other side, a sort of operculum, covering the two succeeding pairs</p> | <p>XI. ASELLIDÆ.</p> |
| <p>a'. Lateral parts of cephalon usually lamellarly expanded. Eyes, when present, usually subdorsal. Peduncle of inferior antennæ generally with small accessory appendage outside of third joint. Legs subequal in length with dactylus, generally bi- or triungiculate; first pair sometimes prehensile. First pair of pleopoda in female transformed into a single large opercular plate. Outer lamellæ of two succeeding pairs narrow and confluent with basal part</p> | <p>XII. JANIRIDÆ.</p> |

* Sars, Crust. of Norway, ii. 1897, pts. 5, 6, pp. 95, 98.

Family XI. Asellidæ.

24. ASELLUS, Geoffroy.

Dactyli of last six pairs of pereopoda uniungiculate. Lateral margins of segments produced. Eyes distinct, lateral. Mandibles strong, with a three-jointed palp. Head without rostrum.

66. *Asellus tomalensis*, Harford.

Asellus tomalensis, Harford, Proc. Cal. Acad. Sci. vii. 1877, pt. i. pp. 54, 55.

Hab. Tomales Bay, California.

Family XII. Janiridæ.

Analytical Key to the Genera of Janiridæ.

- a.** Eyes dorsal. Antennæ of first pair well developed, with multiarticulate flagellum. Antennæ of second pair long, with multiarticulate flagellum, peduncular joints not dilated. Mandibles with a three-jointed palp and with cutting-part separated from molar part by a deep incision.
- b* Head without any true rostrum. First pair of antennæ extremely small, with flagellum rudimentary. Second pair of antennæ of moderate length, without any distinctly squamiform appendage. First pair of legs not prehensile. Uropoda extremely small, branches very short, nodiform 25. *Jara*.
- b'.* Head with prominent rostral projection, or with a comparatively small rostrum, or without rostrum. First pair of antennæ well developed; flagellum multiarticulate. Second pair of antennæ very much elongated, with a well-marked scale-like appendage outside of third joint. First pair of legs prehensile, carpus large, subfusiform, and edged inside with spines; propodus narrow, linear, and very movably articulated to carpus, so as to admit of being bent in against it. Uropoda largely developed, with branches slightly unequal.
- c.* Head with lateral parts produced to very prominent acute lappets. Segments of thorax with lateral parts lacinate and produced. Caudal segment forming on each side, at the end, a triangular expansion 26. *Ianthe*.
- c'.* Head with lateral parts not produced into lappets. Segments of thorax with lateral parts not produced, not lacinate. Caudal segment rounded, not expanded laterally 27. *Janira*.

* *Id.* pts. 5, 6, pp. 98-100, 103, 104.

- a'*. Eyes lateral. Antennæ of the first pair small, with flagellum obsolete. Antennæ of the second pair short, with peduncular joints dilated; rudimentary flagellum containing five articles and equal in length to the width of the head. Mandibles with a three-jointed palp and with cutting-part composed of five teeth 28. *Jæropsis*.

25. JÆRA, Leach.

67. *Jæra wakishiana*, Spence Bate.

Jæra wakishiana, Spence Bate, Lord's Naturalist in British Columbia, ii. 1866, p. 282; C. Bovallius, Bihang till K. Sv. Vet.-Akad. Handl. ii. 1886, no. 15, p. 49.

Hab. Esquimault Harbour, British Columbia.

26. IANTHE, Bovallius.

Analytical Key to the Species of Ianthe.

- a.* Head with prominent rostrum; lateral margins incised and produced into two angulations. Second and third thoracic segments with epimeral lobes double. Terminal segment of body with lateral angulations and central portion acute 68. *I. triangulata*, sp. n.
- a'*. Head without rostrum; lateral margins entire and produced into one anterior angulation. Second and third thoracic segments with epimeral lobes single. Terminal segment of body with lateral angulations and central portion blunt and rounded 69. *I. erostrata*, sp. n.

68. *Ianthe triangulata*, sp. n.

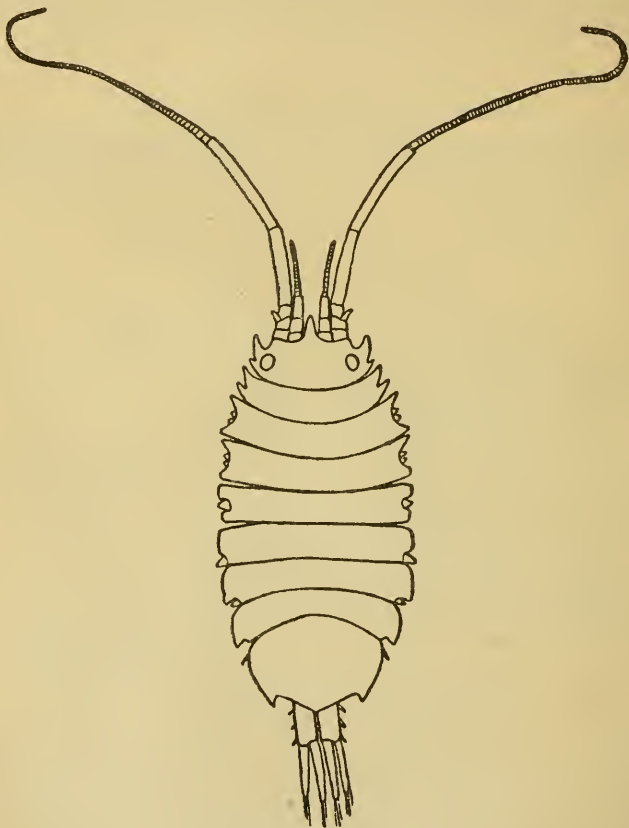
Surface of body smooth; colour yellow, marked with black dots.

Head with rostrum in front equal to one half the length of head. Anterior margin lobate, between the rostrum and the lateral angulations. The side of the head is produced in two angulations, the upper one extending in an oblique direction and not reaching beyond the anterior margin of the head. The first pair of antennæ are not as long as the width of the head. The second pair of antennæ are longer than the body.

The lateral margins of the first segment are produced into two angulations; those of the second and third into two, with the epimera produced into two-lobed angulations; those of the fourth into two lobes, the small epimeral lobe or angulation between; and those of the fifth, sixth, and seventh into one large upper lobe and one small lower lobe.

The terminal segment is produced backward at the sides into two sharply pointed angulations, with a broad triangulate central lobe between, to which the uropoda are attached.

Fig. 29.

*Ianthe triangulata.* $\times 13\frac{1}{3}$.

The uropoda are longer than the terminal segment, the outer branch somewhat shorter than the inner one, and both fringed with hairs.

First pair of legs prehensile, remaining pairs simple.

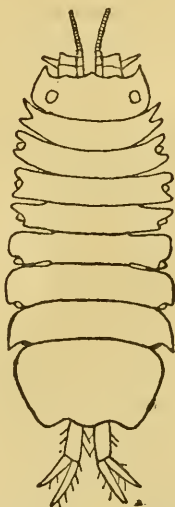
Two specimens were collected by Mr. Heath at Monterey Bay, California.

Type. No. 22582, U.S. N. M.

69. *Ianthe erostrata*, sp. n.

Head two and a half times broader than long, with prominent antero-lateral angulations. Lateral margins produced, entire. In place of the rostrum, which marks all the other known species of this genus, there is a small median point. The eyes are dorsally situated a short distance from the lateral edges. The first pair of antennæ are short, not equal to the width of the head. The second pair are broken in the specimen examined.

Fig. 30.

*Ianthe erostrata*. $\times 13\frac{1}{3}$.

The first thoracic segment is produced laterally in two angulations. The second, third, and fourth segments are each produced in two angulations, with a small epimeral lobe in between. The fifth, sixth, and seventh segments have each a large anterior lobe and a small posterior epimeral lobe.

The terminal segment has two bluntly triangular angulations, one on either side of a bluntly triangular central portion. The uropoda are about as long as the caudal segment, are styliform, with branches nearly equal. The first pair of legs are prehensile. The others are simple, biunguiculate. One specimen was collected at Chichagof Harbour, Attu (Aleutian Islands), by Mr. W. H. Dall.

Type. No. 22610, U.S. N. M.

27. JANIRA, Leach.

70. *Janira occidentalis*, Walker.

Janira occidentalis, Walker, Trans. Liverpool Biol. Soc. xii. 1898, pp. 280, 281, pl. xv. figs. 7-10.

Hab. Puget Sound, Washington.

28. JÆROPSIS, Kœhler.

71. *Jæropsis lobata*, sp. n.

Surface of body smooth.

Colour very peculiar and striking. The head is brown. The first thoracic segment is perfectly white, without any

Fig. 31.

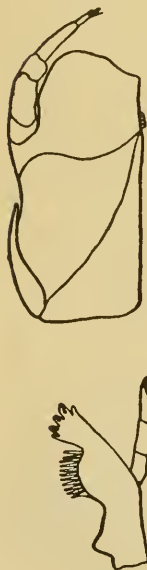


Fig. 32.

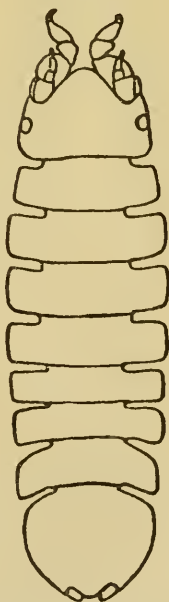


Fig. 33.



Fig. 31.—Maxilliped and mandible of *Jæropsis lobata*.

Fig. 32.—*Jæropsis lobata*. $\times 20$.

Fig. 33.—Antennæ of *Jæropsis lobata*.

markings; the second, third, and fourth segments are brown; the fifth and sixth are white; the seventh thoracic segment and the caudal segment are brown. This peculiar marking gives the body a striped appearance.

Head large; front produced into a prominent triangular process, with rounded apex, very broad at the base, occupying half the anterior margin of the head. The antero-lateral angles of the head are produced in acute angles on either side to a distance equal to half the length of the frontal process. The eyes, which are small, are situated on the extreme lateral margins of the head. The first pair of antennæ are extremely small, equal in length to less than half the width of the head; flagellum obsolete. The second pair of antennæ are also extremely short, equal in length to the width of the head, with rudimentary flagellum, composed of about five joints, and with peduncular joints dilated. Mandibles have the cutting-part composed of five teeth; palp three-jointed.

The thoracic segments are subequal in length, with lateral edges produced, but not lacinate, and separated from each other by lateral incisions.

Caudal segment regularly rounded, with two small incisions at the place where the uropoda are attached, between which is a rounded lobe. Uropoda are extremely small, short, nodiform.

Legs simple, similar in structure, with biunguiculate dactyli.

Two specimens from Monterey Bay, California, were sent by Mr. Heath.

Type. No. 22583, U.S. N. M.

This species is very close to *Jæropsis brevicornis*, but differs in the following points:—the colouring of the body, which in *J. brevicornis* is perfectly transparent and colourless, with the exception of the head, which is marked with a large brown spot, while in our species the head is dark, as are also the entire second, third, fourth, and seventh thoracic segments and the terminal abdominal segment, the other segments being colourless; in the shape of the terminal segment, which is perfectly rounded in *J. brevicornis* and fringed with hairs, while in our species there are two posterior incisions for the reception of the uropoda, and an absence of hairs; in the larger median lobe on the anterior margin of the head; in the acuteness of the antero-lateral angles of the head, which are rounded in *J. brevicornis*; in the more angular post-lateral angles of the head; and in the more angular antero- and post-lateral angles of the thoracic segments. Other differences are noticed from a comparison of both pairs of antennæ.

V. ONISCOIDEA.

Analytical Key to the Families of Oniscoidea.

a. Flagellum of outer antennæ not multiarticulate. Buccal mass not very prominent below. First maxillæ have two plumose setæ on the inner plate. Mandibles with molar expansion obsolete, without any triturating surface, it being replaced by brush-like recurved setæ. Maxillipeds with terminal part three-articulate; epignath large, flanking the basal part. Sexual appendage of male simple and generally connected with inner rami of first pair of pleopoda. Uropoda with inner branch smaller than outer and attached far in front of it.

b. External antennæ generally long, close together, with antennal openings large. Body scarcely able to be contracted into a ball. Head less manifestly immersed in first thoracic segment. Lateral parts of the head separated by a vertical marginal and inframarginal line. Clypeus arched. Legs generally long. Uropoda produced, reaching beyond the terminal segment of the abdomen and the post-terminal segment. Terminal segment narrower than preceding ones and conically produced at end

XIII. ONISCIDÆ.

b'. External antennæ generally short, with antennal openings small. Body able to be contracted into a ball. Head immersed in first thoracic segment. Lateral parts of the head undifferentiated. Clypeus perpendicular. Legs generally short. Uropoda short, not reaching beyond the epimera of the terminal segment of the abdomen or the post-terminal segment. Terminal segment short and broad

XIV. ARMADILLIDIDÆ.

a'. Flagellum of outer antennæ multiarticulate. Buccal mass prominent. First maxillæ have three plumose setæ on the inner plate. Mandibles with molar expansion large and broad, exhibiting a finely fluted triturating surface. Maxillipeds with terminal part distinctly five-articulate; epignath short. External sexual appendages in male double. Inner ramus of first pair of pleopoda of a similar structure in both sexes. Uropoda with both branches styliform

XV. LIGIDÆ.

Family XIII. Oniscidæ.

Analytical Key to the Genera of Oniscidæ.

- a.* Flagellum of external antennæ biarticulate.
External opercular ramus of the first, second,
and rarely of the third or all the pairs of the
abdominal appendages furnished with trachea.
- b.* Lateral lobes of the head large; frontal lobe
more or less projecting. Eyes subdorsal.
First two abdominal segments generally very
short; three following ones large, with large
epimera. Terminal segment not reaching
beyond the epimera of preceding segment.
Uropoda somewhat even, longer in male than
in female. 29. *Porcellio*.
- b'.* Lateral lobes of head small, hardly projecting;
frontal lobe obsolete. Eyes lateral. First
two abdominal segments scarcely shorter
than those following. Epimera of all the
segments small. Terminal segment ex-
tending beyond the epimera of preceding
segment. Uropoda subequal in both sexes. 30. *Metoponorthus*.
- a'.* Flagellum of external antennæ triarticulate.
External opercular ramus of abdominal append-
ages containing no special respiratory organ.
- b.* Front of head produced at the middle and at
the sides in tubercles; lateral tubercles horn-
like. Epimera of abdominal segments mode-
rate or small 31. *Alloniscus*.
- b'.* Front of head not produced, with lateral lobes.
Epimera of abdominal segments large 32. *Lyprobius*.

29. PORCELLIO, Latreille.

Analytical Key to the Species of Porcellio.

- a.* Surface of body smooth.
- b.* Frontal median lobe of head rounded, a
little produced. Articles of the flagel-
lum of external antennæ equal in length.
Last segment of the abdomen with its
extremity widely rounded 72. *P. formosus*, Stuxberg.
- b'.* Frontal median lobe of head more
acute, minute. First article of the
flagellum of external antennæ equal
in length to the other or a little
longer. Last segment of the abdomen
with its extremity acute 73. *P. lævis*, Latreille.
- a'.* Surface of body closely and roughly
granulated 74. *P. scaber*, Latreille.

72. *Porcellio formosus*, Stuxberg.

Porcellio formosus, Stuxberg, Öfversigt af Vetensk.-Akad. Förhandl.
1875, no. 2, p. 57; Budde-Lund, Crust. Isop. Terrestria, 1883, p. 141.

Hab. San Francisco and San Pedro, California.

73. *Porcellio lævis*, Latreille.

- Porcellio lævis*, Latreille, Hist. Crust. Ins. vii. p. 46; Gen. Crust. i. p. 71; Leach, Edinb. Encycl. vii. p. 406; Transact. xi. p. 375.
Oniscus lævis, Lamarck, Hist. Nat. An. s. Vert. v. p. 154; 2nd ed. v. p. 261.
 (?) *Porcellio lævis*, Risso, Crust. Nice, p. 156; Hist. Nat. pp. 119, 163; Desmarest, Consid. p. 321.
 (?) *Porcellio Degeeri*, Audouin and Savigny, Descript. de l'Égypte, p. 289, pl. xiii. fig. 5.
Porcellio eucercus, Brandt, Bull. Soc. Imp. d. Moscou, vi. 1833, p. 177; Milne-Edwards, Hist. Nat. des Crust. iii. p. 168.
Porcellio syriacus, Brandt, Bull. Soc. Imp. d. Moscou, vi. 1833, p. 178; Milne-Edwards, Hist. Nat. des Crust. iii. p. 170.
Porcellio musculus, Brandt, Bull. Soc. Imp. d. Moscou, vi. 1833.
Porcellio cinerascens, Brandt, Bull. Soc. Imp. d. Moscou, vi. 1833, p. 178.
Porcellio dubius, Brandt, Bull. Soc. Imp. d. Moscou, vi. 1833, p. 178; Milne-Edwards, Hist. Nat. des Crust. iii. p. 170.
Porcellio Poeyi, Guérin, Comptes Rendus, 1837, p. 132.
Porcellio lævis, Milne-Edwards, Hist. Nat. des Crust. iii. p. 169; Règne An. Planch. p. 71 bis, fig. 2.
Porcellio urbicus, Koch, Deutsch. Crust. p. 36.
Porcellio Degeerii, Brandt, Wagner, Reise Alg. iii. 1836, p. 278.
Porcellio ovatus, Zaddach, Synops. p. 13.
Porcellio flavipes, Koch, Berichtig. &c. p. 206, pl. viii. fig. 97.
Porcellio Degeerii, Lucas, Expl. d'Alg. i. pp. 69, 139.
Porcellio lævis, Lereboullet, Mém. de la Soc. de Strasbourg, iv. p. 45, pl. i. fig. 7, pl. iii. figs. 55-60.
Porcellio Poeyi, Guérin, Ramon de la Sagra, Crust. p. 67; Saussure, Mém. p. 61, pl. v. fig. 34.
Porcellio cubensis, Saussure, Mém. p. 61, pl. v. fig. 35.
Porcellio Sumichrasti, Saussure, Mém. p. 62, pl. v. fig. 36.
Porcellio cotilla, Saussure, Mém. p. 62, pl. v. fig. 37.
Porcellio mexicanus, Saussure, Mém. p. 63, pl. v. figs. 39, 40.
Porcellio aztecus, Saussure, Mém. p. 63, pl. v. fig. 38.
Porcellio interruptus, Heller, Verh. zool.-bot. Ges. Wien, xi. p. 495; 'Novara' Exp. p. 136, pl. xii. fig. 6 (vix adult).
Porcellio lævis, Plateau, Crust. Isop. p. 10; Budde-Lund, Nat. Tidskrift, 3rd ser. vii. p. 236.
Porcellio aztecus, Miers, Proc. Zool. Soc. London, 1877, p. 669.
Porcellio lævis, Uljanin, Crust. Turkest. p. 17, pl. iv. figs. 1-10; Budde-Lund*, Crust. Isop. Terrestria, 1885, pp. 138-141; Hansen, Bull. Mus. Comp. Zool. Harvard College, xxxi. 1897, p. 124.

Hab. Distribution world-wide; Colfax, California (*Cook and Jaquay*); Monterey, California; Unalaska.

74. *Porcellio scaber*, Latreille.

- Oniscus asellus*, Linnæus, Fn. Su. p. 2058; Syst. Nat. i. p. 1061; in part.
Porcellio scaber, Latreille, Hist. Crust. Ins. vii. p. 45; Gen. Crust. i. p. 70; Leach, Edinb. Encycl. vii. p. 406.

* See Budde-Lund for further synonymy.

- Oniscus granulatus*, Lamarek, Hist. Nat. des Animaux sans Vertèbres, v. p. 154; 2nd ed. v. p. 261.
- Porcellio scaber*, Risso, Crust. de Nice, p. 155; Hist. Crust. p. 119.
- Porcellio nigra*, Say, Journ. Phil. Acad. i. p. 432.
- Porcellio granulatus*, Brébisson, Mém. Soc. Calv. 1825, p. 261.
- Porcellio scaber*, Desmarest, Consid. Crust. p. 321; Brandt and Ratzeburg, Med. Zool. ii. p. 77, pl. xii. figs. 1-4 and A-B; Brandt, Consp. p. 14 (Bull. Soc. Imp. d. Naturalistes de Moscou, vi. 1833).
- Porcellio Brandtii*, Milne-Edwards, Hist. Nat. des Crust. iii. p. 168.
- Porcellio granulatus*, Milne-Edwards, Hist. Nat. des Crust. iii. p. 169, pl. xxxii. fig. 21.
- Porcellio scaber*, Milne-Edwards, Cuvier, Règ. An. 1849, pls. lxxi.-lxxi. bis.
- Porcellio nigra*, Gould, Rep. Crust. p. 337.
- Porcellio scaber*, Koch, Deutschlands Crust. p. 34.
- Porcellio dubius*, Koch, Deutschlands Crust. p. 34.
- Porcellio asper*, Koch, Berichtig. p. 207, pl. viii. fig. 98.
- Porcellio scaber*, Lereboullet, Mém. Strasb. iv. p. 34, pl. i. figs. 4, 5, pl. ii. figs. 43-47.
- Porcellio gemmulatus*, Dana, Crust. U.S. Expl. Exp. 1853, p. 725, pl. xlvii. fig. 7; Stimpson, Journ. Bost. Soc. Nat. Hist. vi. p. 66.
- Philoscia tuberculata*, Stimpson, Proc. Cal. Acad. Sci. i. p. 89.
- Porcellio scaber*, Sill, Crust. Sieb. 1861, p. 3; Bate and Westwood, Brit. Crust. ii. p. 475.
- Porcellio paulenses*, Heller, 'Novara' Exp. p. 136, pl. xii. fig. 5.
- Porcellio scaber*, Plateau, Bull. Acad. r. Belgique, 2nd ser. xxix. 1870, no. 2, p. 8; E. Brandt, Horæ Soc. Ent. Ross. viii. p. 167; Budde-Lund, Nat. Tidsskrift, 3rd ser. vii. p. 238; Prospectus, p. 3; Bos, Crust. Hedrioph. Nederl. pp. 38, 91; Budde-Lund, Crust. Isop. Terrestria, 1885, pp. 129-131*.
- Hab.* Distribution world-wide; San Francisco, California; San Pedro, California; Puget Sound.
- Budde-Lund suggests that *Porcellio gemmulatus*, Dana, differs in no wise from *Porcellio scaber* †.

30. METOPONORTHUS, Budde-Lund.

75. *Metoponorthus pruinosus*, Budde-Lund ‡.

- Metoponorthus pruinosus*, Budde-Lund, Crust. Isop. Terrestria, 1885, pp. 169, 170.
- Porcellio maculicornis*, Koch, Deutschlands Crustaceen, 1840, p. 34; Stuxberg, Öfversigt af Vetensk.-Akad. Förhandl. 1875, no. 2, p. 55.
- Hab.* California.

31. ALLONISCUS, Dana.

Analytical Key to the Species of Alloniscus.

a. Surface of body very densely granulated.

Margins of epimera serrated. 76. *A. mirabilis*, Stuxberg.

* See Budde-Lund for further synonymy.

† Crust. Isop. Terrestria, 1885, p. 131.

‡ See Budde-Lund for further synonymy.

a'. Surface of body punctate.

b. Lateral processes of the head large, [Lund.
prominent 77. *A. cornutus*, Budde-

b'. Lateral processes of the head small,
scarcely prominent 78. *A. perconvexus*, Dana.

76. *Alloniscus mirabilis* (Stuxberg).

Rhinoryctes mirabilis, Stuxberg, *Øfversigt af Vetensk.-Akad. Förhandl.*
1875, no. 2, p. 51.

Alloniscus mirabilis, Budde-Lund, *Crust. Isop. Terrestria*, 1885, p. 229.

Hab. California.

77. *Alloniscus cornutus*, Budde-Lund.

Alloniscus cornutus, Budde-Lund, *Crust. Isop. Terrestria*, 1885, pp. 228,
229.

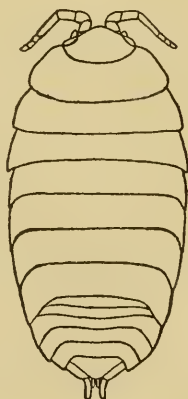
Hab. California.

78. *Alloniscus perconvexus*, Dana.

Alloniscus perconvexus, Dana, *Proc. Acad. Nat. Sci. Philad.* vii. p. 176 ;
Stimpson, *Journ. Bost. Soc. Nat. Hist.* vi. p. 66 ; Budde-Lund,
Crust. Isop. Terrestria, 1885, p. 225.

(?) *Alloniscus maculosus*, Harford, *Proc. Cal. Acad. Sci.* pt. 1, vii. 1877,
p. 54.

Fig. 34.



Alloniscus perconvexus, Dana. × 8.

Hab. California ; Pacific Grove ; Santa Barbara ; Monterey
Bay, collected by Mr. Heath ; Tillamook Head, Oregon.

- pencils of hairs. Last segment of body broad, with distinct epimeral plates. Maxillipeds with palp four- to five-jointed; epignath rounded. 34. *Ligia*.
- a'*. Uropoda unequal in length.
- b*. Extremity of uropods furnished with two long apical bristles. Interior mala of right mandible with three pencils of hairs, of left mandible with five pencils of hairs. Last segment of body small and without any epimeral plates. Maxillipeds with a five-jointed palp; epignath narrow, linguiform. 35. *Ligidium*.
- b'*. Extremity of uropods not furnished with two long apical bristles. 36. *Styloniscus*.

34. *LIGIA*, Fabricius.*Analytical Key to the Species of Ligia.*

- a*. External antennæ shorter than the body.
- b*. Caudal stylets about equal to half the length of body. 82. *L. occidentalis*, Dana.
- b'*. Caudal stylets about equal to one fifth the length of body. 83. *L. Pallasii*, Brandt.
- a'*. External antennæ longer than body or equal to length of body. Caudal stylets about equal to two thirds length of body. 84. *L. exotica*, Roux.

82. *Ligia occidentalis*, Dana.

Ligia occidentalis, Dana, U.S. Expl. Exp., Crust. ii. p. 742, pl. xlix. fig. 7; Proc. Acad. Nat. Sci. Philad. vii. p. 176; Stimpson, Bost. Journ. Nat. Hist. vi. 1857, p. 66; Harford, Proc. Cal. Acad. Sci. vii. 1877, p. 116; Budde-Lund, Crust. Isop. Terrestria, 1885, p. 264.

Hab. California: San Francisco Bay; San Diego; Sacramento River; Monterey Bay; Lower California.

83. *Ligia Pallasii*, Brandt.

Ligia Pallasii, Brandt, Bull. Soc. Impér. des Natur. de Moscou, vi. 1833, p. 172.

Ligia dilatata, Stimpson, Bost. Journ. Nat. Hist. 1857, p. 67, pl. xxii. fig. 8; S. I. Smith, Report of Progress of Geological Survey of Canada, 1878-79.

Ligia septentrionalis, Lockington, Proc. Cal. Acad. Sci. vii. 1877, pt. 1, p. 46.

Ligia Stimpsoni, Miers, Proc. Zool. Soc. 1877, p. 671 (see footnote).

Ligia Pallasii, Budde-Lund, Crust. Isop. Terrestria, 1885, pp. 261, 262.

Hab. Unalaska; Sitka; Tanager, Aleutian Islands; Victoria, Vancouver Island; Puget Sound; California.

84. *Ligia exotica*, Roux.*Ligia exotica*, Roux, Crust. Médit. p. 3, pl. xiii. fig. 9.*Ligia grandis*, Perty, Spix, H. Martius, p. 212, pl. xl. fig. 13.*Ligia Gaudichaudii*, Milne-Edwards, Hist. Nat. des Crust. iii. p. 157.*Ligia Baudiniana*, Milne-Edwards, Hist. Nat. des Crust. iii. p. 155.*Ligia (Italica) coriacea*, Koch, Deutschl. Crust. p. 36; Berichtig. p. 211.*Ligia Gaudichaudii*, Dana, Expl. Exp. p. 741, pl. xlix. figs. 6 a-h;

Nicolet, Gay, Hist. Chile, iii. p. 265.

Ligia Baudiniana, Miers, Proc. Zool. Soc. 1877, p. 670.*Ligia exotica*, Budde-Lund, Crust. Isop. Terrestria, 1885, pp. 266-268.*Hab.* Widely distributed; California; Topolobampo, Mexico (Mr. Edward Palmer).

35. LIGIDIUM, Brandt.

Analytical Key to the Species of Ligidium.

- a. Inner process of the basal article of the uropoda three times shorter than the terminal external branch; internal terminal branch reaching the apex of the external branch; the two terminal hairs equal in length to the external branch. 85. *L. hypnorum* (Cuvier).
- a'. Inner process of the basal article of the uropoda four times shorter than the terminal external branch; internal terminal branch long, extending much beyond the apex of the external branch, being a sixth part longer; the two terminal hairs short, equal in length to half the external branch 86. *L. tenue*, Budde-Lund.

85. *Ligidium hypnorum* (Cuvier).*Oniscus hypnorum*, Cuvier, Journ. d'Hist. nat. ii. p. 19, pl. xxvi.*Ligidium hypnorum*, Budde-Lund, Naturhistorisk Tidsskrift, 3rd ser.

vii. 1870, p. 225; Stuxberg, Cefversigt af Vetensk.-Akad. Förhandl. 1875, no. 2, p. 48.

Hab. California (Stuxberg).86. *Ligidium tenue*, Budde-Lund.*Ligidium tenue*, Budde-Lund, Crust. Isop. Terrestria, 1885, p. 258.*Hab.* Sitka Island.

36. STYLONISCUS, Dana.

87. *Styloniscus gracilis*, Dana.*Styloniscus gracilis*, Dana, Proc. Acad. Nat. Sci. Philad. vii. 1854-55, p. 176; Stimpson, Journ. Bost. Soc. Nat. Hist. vi. 1857, p. 66;

Budde-Lund, Crust. Isop. Terrestria, 1885, p. 271.

Hab. California.

VI. EPICARIDEA.

Family XVI. Bopyridæ *.

Body of female primarily disciform, variously modified subsequently by retrogressive metamorphosis; distinctly segmented; more or less asymmetrical, twisted now to right, now to left; dorsal face flattened; head deeply sunk in thorax and carrying in front two pairs of rudimentary antennæ; eyes, when present, dorsal. Maxillipeds lamellar, biarticulate, obtecting the oral area below, and more frequently exhibiting a small terminal joint, and, at base, two curved lanceolate appendages. Legs seven pairs, sometimes obsolete on one side, and all of same structure, short, prehensile; coxal plates obsolete or distinctly defined. Incubatory plates, five pairs, more or less arching over the ventral face of the thorax; first pair, as a rule, concealed by second and divided by a transversal fold into two segments. Abdomen more or less distinctly segmented; pleopoda forming simple or double lamellæ, all of the same structure, rarely obsolete. Uropoda when present simple lanceolate. Male elongate, very small, symmetrical; segments of thorax distinct, those of abdomen sometimes distinct, sometimes confluent. Mouth-parts simple, conic; posterior antennæ with flagellum four-articulate; legs of uniform structure; uropoda with inner branch shorter than outer. Parasitic on decapodous Crustacea †.

This family has not been sufficiently worked up to offer as yet any systematic arrangement of the genera ‡.

37. ARGEIA, Dana.

Analytical Key to the Species of Argeia.

- a.* Head transverse. All the thoracic branchial appendages present. All the abdominal appendages present. 88. *A. pugettensis*, Dana.
a'. Head bilobate. Thoracic branchial appendages apparently absent in some of anterior segments. Last three pairs of abdominal appendages wanting. 89. *A. depauperata*, Stimpson.

* Sars, 'Crustacea of Norway,' ii. 1898, pp. 195, 196, pls. xi., xii.

† Bopyridæ parasitic on *Crangon crangon* (Linnaeus), *Nectocrangon lar* (Owen), *Nectocrangon alaskensis*, Kingsley, and other shrimps, have been reserved for more detailed study.

‡ See Hansen, Bull. Mus. Comp. Zool. Harvard College, xxxi. (1897) p. 112.

88. *Argeia pugettensis*, Dana.

Argeia pugettensis, Dana, U.S. Expl. Exp., Crust. ii. p. 804, pl. liii. fig. 7; Stimpson, Bost. Journ. Nat. Hist. vi. 1857, p. 71.

Hab. Puget Sound, on *Crangon munita*.

89. *Argeia depauperata*, Stimpson.

Argeia depauperata, Stimpson, Bost. Journ. Nat. Hist. vi. 1857, p. 71.

Hab. San Francisco Bay, on *Crangon franciscorum*.

38. PHYLLODURUS, Stimpson.

90. *Phyllodurus abdominalis*, Stimpson.

Phyllodurus abdominalis, Stimpson, Bost. Journ. Nat. Hist. vi. 1857, p. 71; Lockington, Proc. Cal. Acad. Sci. vii. 1876, pt. 1, p. 57.

Hab. Puget Sound; Tomales Bay, California; "on the common *Upogebia*."

39. BOPYROIDES, Stimpson.

91. *Bopyroides acutimarginatus*, Stimpson.

Bopyroides acutimarginatus, Stimpson, Proc. Acad. Nat. Sci. Philad. xvi. 1864, p. 156.

Hab. Puget Sound, on *Spirontocaris brevirostris*.

40. PSEUDIONE, Kossmann.

Analytical Key to the Species of Pseudione.

- a. Antennæ five-jointed. First pair of maxillæ absent. In male, eyes present; maxillæ wanting; last segment of abdomen cordate in form, being narrow anteriorly and having its hinder margin notched 92. *P. Giardi*, Calman.
- a'. Antennæ four-jointed. Maxillæ normal, present. In male, eyes wanting; maxillæ normal, present; last segment of abdomen triangular and entire 93. *P. galacanthæ*, Hansen.

92. *Pseudione Giardi*, Calman.

Pseudione Giardi, Calman, Ann. N. Y. Acad. Sci. xi. 1898, no. 13, pp. 274-281, pl. xxxiv. fig. 5.

Hab. Puget Sound, on *Pagurus ochotensia* (Brandt).

93. *Pseudione galacanthæ*, Hansen.

Pseudione galacanthæ, Hansen, Bull. Mus. Comp. Zool. Harvard College, xxxi. 1897, pp. 118-120, pl. v. fig. 22 i.

Hab. Gulf of California, in branchial cavity of *Galacantha diomedee*, var. *parvispina*, Faxon.

41. BATHYGYGE, Hansen.

94. *Bathyggyge grandis*, Hansen.

Bathyggyge grandis, Hansen, Bull. Mus. Comp. Zool. Harvard College, xxxi. 1897, pp. 122, 124, pl. vi. figs. 2, 2 e.

Hab. Off Acapulco, in branchial cavity of *Glyphocrangon spinulosa*, Faxon.

42. CRYPTIONE, Hansen.

95. *Cryptione elongata*, Hansen.

Cryptione elongata, Hansen, Bull. Mus. Comp. Zool. Harvard College, xxxi. 1897, pp. 112-115, pl. iii. figs. 5, 5 a, pl. iv. figs. 1, 1 g.

Hab. Near Galapagos Islands, in branchial cavity of *Nematocarcinus Agassizii*, Faxon, which occurs as far north as Acapulco, Mexico.

43. PARARGEIA, Hansen.

96. *Parargeia ornata*, Hansen.

Parargeia ornata, Hansen, Bull. Mus. Comp. Zool. Harvard College, xxxi. 1897, pp. 120-122, pl. vi. figs. 1, 1 z.

Hab. Off Acapulco, Mexico, in branchial cavity of *Sclerocrangon proca*, Faxon.

44. IONE, Latreille.

97. *Ione cornuta*, Spence Bate.

Ione cornuta, Spence Bate, Lord's Naturalist in British Columbia, ii. 1866, p. 282.

Ione thoracica, Heller, Carcinolog. Beitrag z. Fauna der Adriat. Meeres, Verhand. zool.-bot. Gesellsch. Wien, xv. pp. 979-984, pl. xvii.

Ione cornuta, Bate and Westwood, Brit. Sessile-eyed Crust. ii. p. 253; Giard and Bonnier, Contributions à l'étude des Bopyriens, 1887.

Hab. Esquimaux Harbour, British Columbia, in branchia of *Callianassa longimana*; Vancouver Island.